

SCOPE OF CLAIMS

1. An optical module comprising:

5 a first optical element for reflecting an optical signal of a first wavelength component and transmitting an optical signal of second and third wavelength components;

a first light receiving subassembly, optically coupled to the first optical element, provided to receive the optical signal of the first wavelength component;

10 a second optical element for reflecting the optical signal of the second wavelength component and transmitting the optical signal of the third wavelength component;

a second light receiving subassembly, optically coupled to the second optical element, provided to receive the optical signal of the second wavelength component;

15 a light emitting subassembly, optically coupled to the second optical element, provided to generate the optical signal of the third wavelength component; and

20 a light transmitting part optically coupled to the first optical element, the light emitting subassembly, the first optical element, the second optical element, and the first light receiving subassembly being arranged along a predetermined plane, and the light emitting subassembly, the first optical element, the second optical element, and the second light receiving subassembly being arranged along another predetermined plane intersecting at a predetermined angle with the
25 predetermined plane.

2. The optical module according to claim 1, wherein the

second wavelength component is between the first wavelength component and the third wavelength component.

3. The optical module according to claim 1 or 2, further comprising a third optical element provided between the first optical element and the first light receiving subassembly and having an optical characteristic to transmit the optical signal of the first wavelength component and to intercept the optical signal of the second and third wavelength components.

4. The optical module according to claim 3, further comprising a fourth optical element provided between the second optical element and the second light receiving subassembly and having an optical characteristic to transmit the optical signal of the second wavelength component and to intercept the optical signal of the first and third wavelength components.

5. The optical module according to claim 1 or 2, further comprising a fourth optical element provided between the second optical element and the second light receiving subassembly and having an optical characteristic to transmit the optical signal of the second wavelength component and to intercept the optical signal of the first and third wavelength components.

6. The optical module according to claim 1, wherein the light transmitting part has an optical fiber, the light emitting subassembly has a semiconductor laser, and each of the first and second light receiving subassemblies has a photodiode.

7. The optical module according to claim 1 or 6, wherein the first wavelength component is 1.54 μm or more and 1.65 μm or less,

wherein the second wavelength component is 1.47 μm or more and 1.50 μm or less, and

wherein the third wavelength component is 1.26 μm or more and 1.38 μm or less.

5 8. The optical module according to claim 1, further comprising an optical joint sleeve,

wherein the optical joint sleeve comprises:

one end portion, another end portion and a side wall portion arranged along a predetermined axis;

10 a first mount surface extending along a first axis intersecting with the predetermined axis, the first mount surface mounting the first optical element thereon; and

15 a second mount surface extending along a second axis intersecting with the predetermined axis, the second mount surface mounting the second optical element thereon,

wherein the side wall portion has a side face extending in a direction of the predetermined axis so as to permit light to pass through from one of the one end portion and the other end portion to the other,

20 wherein a first plane defined by the first axis and the predetermined axis intersects with a second plane defined by the second axis and the predetermined axis,

wherein the light transmitting part is provided at the one end portion of the optical joint sleeve,

25 wherein the light emitting subassembly is provided at the other end portion,

wherein the first optical element is mounted on the first mount surface,

wherein the second optical element is mounted on the second mount surface, and

5 wherein the optical joint sleeve holds the first light receiving subassembly and the second light receiving subassembly.

9. The optical module according to claim 8, wherein the side wall portion of the joint sleeve includes a first support positioned relative to the first mount surface and provided for supporting the first
10 light receiving subassembly,

wherein the side wall portion of the joint sleeve includes a second support positioned relative to the second mount surface and provided for supporting the second light receiving subassembly,

wherein the first light receiving subassembly is provided on the first support of the side wall portion,
15

wherein the first light receiving subassembly is positioned relative to the first optical element,

wherein the second light receiving subassembly is positioned relative to the second optical element,

20 wherein the light emitting subassembly is provided at said one end portion of the joint sleeve, and

wherein the light emitting subassembly is positioned relative to the second optical element.

10. The optical module according to claim 9, wherein the light transmitting part is positioned relative to the first optical element.
25

11. The optical module according to claim 10, wherein the first

optical element, the second optical element, and the light emitting subassembly are arranged along the predetermined axis by means of the joint sleeve.

12. An optical joint sleeve comprising:

5 one end portion, another end portion, and a side wall portion arranged along a predetermined axis;

a first mount surface extending along a first axis intersecting with the predetermined axis, and provided for mounting a first optical element thereon; and

10 a second mount surface extending along a second axis intersecting with the predetermined axis, and provided for mounting a second optical element thereon,

wherein the side wall portion has a side face extending in a direction of the predetermined axis and the side face is provided to permit light to pass through from one of the one end portion and the other end portion to the other, and

15 wherein a first plane defined by the first axis and the predetermined axis intersects with a second plane defined by the second axis and the predetermined axis.

20 13. The optical joint sleeve according to claim 12, wherein the side wall portion includes a first support positioned relative to the first mount surface and the first support is provided for supporting the first light receiving subassembly, and

25 wherein the side wall portion includes a second support positioned relative to the second mount surface and the second support is provided for supporting the second light receiving subassembly.

14. An optical transceiver comprising:
the optical module as set forth in any one of claim 1, claim 6,
and claims 8 to 11;
a first substrate electrically connected to the first light receiving
5 subassembly; and
a second substrate electrically connected to the light emitting
subassembly and the second light receiving subassembly, and extending
along the other predetermined plane.

15. The optical transceiver according to claim 14, wherein the
10 first light receiving subassembly receives a video signal light, and
wherein the second light receiving subassembly receives a
digital modulated signal light.

16. The optical transceiver according to claim 14, wherein the
first light receiving subassembly receives an analog modulated signal
15 light, and
wherein the second light receiving subassembly receives a
digital modulated signal light.

17. The optical transceiver according to claim 15, wherein the
first light receiving subassembly receives an analog modulated signal
20 light, and
wherein the second light receiving subassembly receives a
digital modulated signal light.

18. The optical transceiver according to claim 14, wherein the
first substrate mounts the second substrate thereon, and
25 wherein the second substrate and the optical module are
provided along the other predetermined plane.

19. The optical transceiver according to claim 14, further comprising:

5 a first electronic device mounted on the first substrate and provided to process a video signal from the first light receiving subassembly; and

a second electronic device mounted on the second substrate and provided to process a digital modulated signal from the second light receiving subassembly.

10 20. The optical transceiver according to claim 14, further comprising:

a processing circuit mounted on the first substrate and provided to process an analog modulated signal from the first light receiving subassembly; and

15 a processing circuit mounted on the second substrate and provided to process a digital modulated signal from the second light receiving subassembly.